

II. Remarks

This voluntary amendment is submitted in response to developments during prosecution of a corresponding foreign patent application.

In a recent Official Action issued by the Canadian Intellectual Property Office in respect of corresponding Canadian Patent Application No. 2,345,850, the Canadian Examiner concluded that certain claims (Claims 13 to 20) to a positive displacement valve then on file were either anticipated or rendered obvious by a publication titled Hydraulics, Theory and Applications authored by Werner Götz (which publication was subject of the Supplemental Information Disclosure Statement dated April 15, 2004), which disclosed the basic concept of positive displacement means in the form of a metering cylinder. The applicant responded that the positive displacement valve having a phasing means, and a hydraulic circuit having a positive displacement valve, further having phasing means, was a further refinement that was inventive over the basic concept of positive displacement means in the form of a metering cylinder had been taught by Götz. The claims were accordingly amended by providing a new set of claims directed to the above further refinement.

The applicant herein seeks to amend the present application in like manner. The only difference between the amended Canadian claims and those presented herein is the removal of multiple dependencies.

With regard to the cited art, it is submitted that positive displacement means having phasing means are neither taught nor suggested by Götz, and the applicant therefore submits that claims directed to positive displacement means having phasing means are not rendered obvious by the cited art. In fact, the claims to positive displacement means having phasing means are directed to subject-matter addressing a pressing need in the field in an ingenious manner, which pressing need is exacerbated by designs similar to that taught by Götz.

Götz teaches a metering cylinder providing extension of hydraulic cylinders by displacement of a fixed volume of fluid from one cavity of the metering cylinder to a corresponding cavity in one of the hydraulic cylinders. The stroke of the piston of the hydraulic cylinder is limited by the oil volume contained in the corresponding

cavity of the metering cylinder (or by mechanical stroke limits of the hydraulic cylinder, whichever limitation takes effect first). Similarly, the stroke of the hydraulic cylinders when retracting is limited by the oil volume necessary to fill the cavity of the metering cylinder, or by the oil volume in the hydraulic cylinder, which may or may not be dictated by the mechanical design (stroke limits) of the hydraulic cylinder or metering cylinder.

In a refinement of the present invention, however, the positive displacement means is a dual cavity metering cylinder further possessing piston phasing means (or, alternatively as set out at page 13, line 4 and following of the application as filed, the hydraulic cylinders of a hydraulic platform lift possessing the above positive displacement means alternatively or in addition possess phasing means), and preferably also check valves. This works to provide synchronized movement of the two hydraulic cylinders but then allows unsynchronized movement of one or both of the hydraulic cylinders after the full stroke of the positive displacement means has been reached. Accordingly, new independent Claim 22 to positive displacement means further contains the limitation of the following element, namely: "piston phasing means integral with at least one of the cylinder members". Likewise, new independent Claims 28, 34, and 40, each to a hydraulic platform lift having the positive displacement means, each further recite:

Claim 28: "piston phasing means integral with at least one of the cylinder members"

Claim 34: "piston phasing means integral with at least one of the hydraulic cylinders"

Claim 40: "piston phasing means integral with at least one of the hydraulic cylinders and at least one of the cylinder members"

The effect of this refinement of the present invention, unlike what is achieved in Götz, is that both hydraulic cylinders can reach their full extension even though there may be either volumetric differences or mechanical stroke differences between the two hydraulic cylinders (or between the cavities in the metering cylinder) or fluid loss due to internal/external leakage in the hydraulic circuit. In the invention comprising a hydraulic platform lift, this feature permits levelling of the platform at the top of each lift cycle by means of enabling maximum extension of each hydraulic cylinder, whereas a metering cylinder in accordance with Götz

could not achieve that result where there was a volumetric difference between cylinders or a fluid leak in the circuit. In addition, the preferable check valves, either manual or solenoid-operated, can be employed with the phasing ports to hold the fluid in the hydraulic circuit rather than allowing it to flow from the hydraulic cylinders back into the metering cylinder through the phasing ports.

The Götz reference teaches a closed system providing for synchronized movement of two hydraulic cylinders due to movement of a fixed fluid volume from each cavity of the metering cylinder to the corresponding hydraulic cylinder during extension and that same fixed volume back again during retraction. In the present invention, however, synchronized movement of the hydraulic cylinders is enabled until such time as the pistons pass the phasing ports, and then each of the hydraulic cylinders are provided with the fluid flow necessary to reach their full mechanical stroke limits (which may be different). As is set out clearly at disclosure page 10, line 13 to page 12, line 12, the "out of phase" arrangement that is possible with a Götz-style metering cylinder, whatever the cause, is effectively addressed by incorporating phasing means according to the present invention.

The utility of the present invention becomes especially significant when one considers that substantial loads are supported in such applications as platform lift mechanisms on truck trailers, and the risk of uneven loading poses serious safety issues. By enabling substantially equal hydraulic cylinder extension at both ends of a platform, for example, the load is more evenly supported and the risk minimized. Accordingly, the simple use of a metering cylinder is not the solution to the technical problem in and of itself, but rather only one element of a safe and desirable synchronizing and levelling apparatus when cooperating with piston phasing means in the novel and ingenious manner according to the present invention.

In the Canadian Examiner's only direct comment on the piston phasing means, the Canadian Examiner states that "the effect produced by the second smaller aperture is equivalent to a direct connection line between the pump and the cylinders and, therefore, rendering the valve irrelevant." However, the applicant submits that, in the present invention, this condition of a direct connection is allowed to exist only after cessation of the synchronized movement which occurs

when the metering cylinder reaches its point of full extension. Therefore, the synchronizing characteristics of the valve are rendered irrelevant only during the final stages of hydraulic cylinder extension, to permit automatic levelling of the platform according to the present invention by ensuring that both hydraulic cylinders are fully extended despite any physical cylinder differences or the existence of any fluid leakages. As stated above, synchronized movement of the hydraulic cylinders is enabled until such time as the pistons pass the phasing ports, and then the hydraulic cylinders are provided with the fluid flow necessary to reach their full mechanical stroke limits (which may be different).

It is therefore respectfully submitted that claims directed to positive displacement means with piston phasing means are neither anticipated nor rendered obvious by the cited art, as Götz neither discloses nor suggests the subject-matter. New Claims 22 to 27, attached, are directed to such subject-matter, and it is submitted that they overcome any possible objections grounded in the Götz reference.

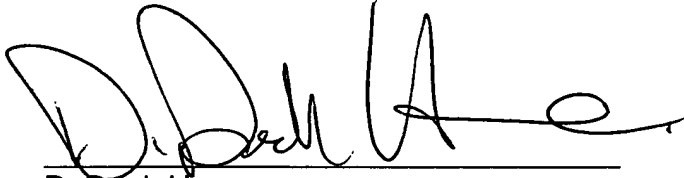
The Canadian Examiner also concluded that Claims 1 to 12 and 21 then on file (directed to a hydraulic platform lift) were directed to a separate invention, and accordingly limited the Official Action to the claims directed to only the positive displacement means.

However, as is clear from the above remarks, the general inventive concept claimed is positive displacement means and piston phasing means to allow unsynchronized movement of one or both of the hydraulic cylinders after the full stroke of the positive displacement means has been reached. That being the case, it is clear that positive displacement means having piston phasing means (new Claims 22 to 27) encompass such inventive concept. Likewise, a hydraulic platform lift possessing positive displacement means, wherein the positive displacement means themselves have piston phasing means (new Claims 28 to 33), at least one of the hydraulic cylinders in the hydraulic circuit possessing the positive displacement means has phasing means (new Claims 34 to 39), or both the hydraulic cylinders and the positive displacement means possess at least one piston phasing means (new Claims 40 to 46) all form part of the same inventive concept, and, it is submitted, are so linked as to not be directed to separate inventions, and accordingly can properly be included in the same application.

In view of the above amendments and remarks, it is believed that this application is now in condition for allowance, and a Notice thereof is respectfully requested.

The applicant's undersigned attorney may be reached by telephone at (403) 298-1994. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. Doak Horne', written over a horizontal line.

D. Doak Horne
Registration No. 33,105

Agent for the Applicant

Gowling Lafleur Henderson LLP
700 - 2nd Street, S.W., Suite 1400, Scotia Centre
Calgary, Alberta
Canada T2P 4V5

DDH:rmh